Final
Determination of Compliance

East Altamont Energy Center, LLC

Bay Area Air Quality Management District
Application 2589

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I Background

This is the Final Determination of Compliance (FDOC) for the East Altamont Energy Center (EAEC), an 1100-MW, natural-gas fired, combined-cycle merchant power plant proposed by Calpine Corporation. The power plant will be located at the northeast edge of Alameda County and will be composed of three nominal 200-MW "F-class" combustion gas turbines, three heat recovery steam generators equipped with 732 MM BTU/hr duct burners and one 550-MW steam turbine generator. The facility will also include a natural-gas fired 129 MM BTU/hr auxiliary boiler, a 19-cell cooling tower, a 300-hp fire pump diesel engine and a natural-gas fired, 11.5 MM BTU/hr (1529 bhp) emergency generator.

Pursuant to BAAQMD Regulation 2, Rule 3, Section 405, this document serves as the Final Determination of Compliance (FDOC) document for the East Altamont Energy Center. It will also serve as the evaluation report for the BAAQMD Authority to Construct application #2589.

The FDOC describes how the proposed facility will comply with applicable federal, state, and BAAQMD regulations, including the Best Available Control Technology and emission offset requirements of the District New Source Review regulation. Permit conditions necessary to insure compliance with applicable rules and regulations and air pollutant emission calculations are also included. This document includes a health risk assessment that estimates the impact of the project emissions on public health and a PSD air quality impact analysis, which shows that the project will not interfere with the attainment or maintenance of applicable ambient air quality standards.

In accordance with BAAQMD Regulation 2, Rule 3, Section 404, the Preliminary Determination of Compliance was subject to the public notice, public inspection, and 30-day public comment period requirements of District Regulation 2, Rule 2, Sections 406 and 407. Accordingly, a notice inviting written public comment was published in the Oakland Tribune on April 17, 2002. The public inspection and comment period ended on May 17, 2002. Three written comments were received and all were considered in the preparation of the FDOC.

II Project Description

1. Permitted Equipment

The applicant is proposing a combined-cycle combustion turbine power generation facility with a maximum electrical output of 1,100-MW. As proposed, each natural gas fired combustion turbine generator (CTG) will have a nominal electrical output of 200-MW and the steam produced by both heat recovery steam generators (HRSGs) will feed to a single steam turbine generator with a nominal electrical output of 550-MW.

The East Altamont Energy Center will consist of the following permitted equipment:

S-1 Combustion Gas Turbine #1, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-2 Heat Recovery Steam Generator #1, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-3 Combustion Gas Turbine #2, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-4 Heat Recovery Steam Generator #2, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-5 Combustion Gas Turbine #3, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System

S-6 Heat Recovery Steam Generator #3, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System

S-7 Auxiliary Boiler, 129 MM BTU/hr, equipped with dry low-NOx burners, abated by A-7 Oxidation Catalyst and A-8 Selective Catalytic Reduction System

S-8 Cooling Tower, 19-Cell, 16,938,000 gallons per hour

S-9 Fire Pump Diesel Engine, Clarke Model JDFP-06WR, 4-cycle, In-Line, 6-Cylinder, turbocharged, lean-burn, 496 cubic inch displacement, 300 bhp, 14.2 gallons per hour maximum fuel use rate

S-10 Emergency Generator, Natural-Gas Fired Engine, Cummins Model QSV81; 1529 bhp, 11.5 MM BTU/hr, 4-stroke, lean-burn, V-16, turbocharged, aftercooled

2. Equipment Operating Scenarios

Turbines and Heat Recovery Steam Generators

As a merchant power plant, market circumstances and demand will dictate the exact operation of the new gas turbine/HRSG power trains. However, the following general operating modes are projected to occur:

Base Load: Maximum continuous output with duct firing and power augmentation steam injection during high ambient temperature conditions

Load Following: Facility would be operated to meet contractual load and spot sale demand, with a total output less than the base load scenario

Partial Shutdown: Based upon contractual load and spot sale demand, it may be economically favorable to shut down one or more turbine/HRSG power trains; this would occur during periods of low overall demand such as late evening and early morning hours

Full Shutdown: May be caused by equipment malfunction, fuel supply interruption, or transmission line disconnect or if market price of electricity falls below cost of generation

HRSG Duct Burner Firing with Steam Injection Power Augmentation:

Under peak demand situations and high ambient temperatures, steam may be injected downstream of gas turbine combustors to lower the temperature of the combustion products and allow an increased fuel use rate, which results in increased mass flow through the gas turbine thereby increasing maximum electrical output.

The following projected operating scenario was utilized to estimate maximum annual air pollutant emissions from the new gas turbines and HRSGs.

- 3,260 hours of baseload (100% load) operation per year for each gas turbine @ 45^{o}F
- 5,100 hours of duct burner firing per HRSG per year with steam injection power augmentation at gas turbine combustors
- 250 one-hour hot start-ups per gas turbine per year
- 50 three-hour cold start-ups per gas turbine per year

3. Air Pollution Control Strategies and Equipment

The proposed East Altamont Energy Center includes sources that trigger the Best Available Control Technology (BACT) requirement of New Source Review (District Regulation 2, Rule 2, NSR) for emissions of nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POCs), sulfur dioxide (SO_2), and particulate matter of less than 10 microns in diameter (PM_{10}).

a. Selective Catalytic Reduction with Ammonia Injection for the Control of NO_x

The gas turbines, HRSG duct burners, and auxiliary boiler each trigger BACT for NO_x emissions. The gas turbines will be equipped with dry low-NO_x (DLN) combustors, which minimize NO_x emissions by lowering peak flame temperature by premixing combustion air with a lean fuel mixture. The HRSGs will be equipped with low-NO_x duct burners, which are designed to minimize NO_x emissions. The auxiliary boiler will also be equipped with low NO_x burners. In addition, the combined NO_x emissions from the gas turbines and HRSGs and the NOx emissions from the auxiliary boiler will be further reduced through the use of selective catalytic reduction (SCR) systems with ammonia injection.

b. Oxidation Catalyst, Dry Low-NO_x (DLN) Combustors and Good Combustion Practices to control and minimize CO Emissions

The gas turbines, HRSG duct burners, and auxiliary boiler each trigger BACT for CO emissions. The gas turbines will be equipped with dry low-NO_x combustors, which operate on a lean fuel mixture that minimizes incomplete combustion and CO emissions. The HRSGs will be equipped with low-NO_x duct burners which are also designed to minimize CO emissions. Furthermore, the gas turbines, HRSGs, and auxiliary boiler will be abated by oxidation catalysts which will oxidize the CO emissions and create CO_2 and water.

c. Oxidation Catalyst, Dry Low-NO_x (DLN) Combustors and Good Combustion Practices to control and minimize POC Emissions

The Gas Turbines, HRSGs, and auxiliary boiler each trigger BACT for POC emissions. The gas turbines will utilize dry low-NO_x combustors which are designed to minimize incomplete combustion and therefore minimize POC emissions. The HRSGs and auxiliary boiler will be equipped with low-NO_x burners, which are designed to minimize incomplete combustion and therefore minimize POC emissions. Furthermore, the turbines, HRSGs, and auxiliary boiler will be abated by oxidation catalysts which will also reduce POC emissions.

d. Exclusive Use of Clean-burning Natural gas to Minimize SO_2 and PM_{10} Emissions

The gas turbines, HRSG duct burners, and auxiliary boiler will burn exclusively PUC-regulated natural gas to minimize SO_2 and PM_{10} emissions. Because the SO_2 emission rate is proportional to the sulfur content of the fuel burned and is not dependent upon the burner type or other combustion characteristics, the use of "low sulfur content" natural gas will result in the lowest possible emission of SO_2. PM_{10} emissions are minimized through the use of best combustion practices, "clean burning" natural gas, air inlet filters, and lube oil vent coalescers.

Table 1 Summary of Control Strategies and Emission Limitations for Gas Turbines, HRSGs, and Auxiliary Boiler

Source	Control Strategy and Emission Limit				
	NOx	CO	POC	PM_{10}	SO_2
Gas Turbine & HRSG Power Trains	DLN Combustors/SCR	DLN Combustors/ Oxidation Catalyst	DLN Combustors/ Oxidation Catalyst	PUC-Regulated Natural Gas, air inlet filter, lube oil vent coalescer	PUC-Regulated Natural Gas
	2.0 ppmv	4 ppmv	2 ppmv	11.5 lb/hr	1.84 lb/hr
Auxiliary Boiler	LN Burners/SCR	LN Burners/ Oxidation Catalyst	LN Burners/ Oxidation Catalyst	PUC-Regulated Natural Gas	PUC-Regulated Natural Gas
	9 ppmv	50 ppmv	0.6 lb/hr	2.65 lb/hr	0.1 lb/hr

III Facility Emissions

The facility regulated air pollutant emissions and toxic air contaminant emissions are presented in the following tables. Detailed emission calculations, including the derivations of emission factors are presented in the appendices.

Table 2 is a summary of the daily maximum regulated air pollutant emissions for the permitted sources at EAEC. These emission rates are used to determine if the Best Available Control Technology (BACT) requirement of the District New Source Review Regulation (NSR; Regulation 2, Rule 2) is triggered on a pollutant-specific basis. Pursuant to Regulation 2-2-301.1, any new source that will result in POC, NPOC, NO_x, SO_2, PM_{10}, or CO emissions in excess of 10 pounds per highest day per pollutant are subject to the BACT requirement for that pollutant.

Table 2 Maximum Daily Regulated Air Pollutant Emissions for Proposed Sources (lb/day)

Source	Pollutant				
	Nitrogen Oxides (as NO_2)	Carbon Monoxide	Precursor Organic Compounds	Particulate Matter (PM_{10})	Sulfur Dioxide
S-1 Gas Turbine & S-2 HRSG[a]	700	3,879	196.8	276	44.2
S-3 Gas Turbine & S-4 HRSG[a]	700	3,879	196.8	276	44.2
S-5 Gas Turbine & S-6 HRSG[a]	700	3,879	196.8	276	44.2
S-7 Auxiliary Boiler[b]	35.3	120	14.4	63.6	2.2
S-8 Cooling Tower	0	0	0	57.6	0
S-9 Fire Pump Diesel Engine[c]	95	15.84	6.24	2.4	2.4
S-10 Emergency Generator[c]	66	210	36	2.64	0.2

[a]NOx, CO, and POC emission rates are based upon one 3-hour cold start-up, one 1-hour hot startup and 20 hours of Gas Turbine /HRSG full load operation at maximum combined firing rate of 2,630.8 MM BTU/hr in one day; PM_{10} and SO_2 emission rates are based upon 24 hours of Gas Turbine/HRSG baseload operation with duct burner firing at maximum combined firing rate of 2,630.8 MM BTU/hr in one day; see appendix B, Table B-13

[b]emission rates based upon 24 hr/day operation at maximum firing rate of 129 MM BTU/hr

[c]emission rates based upon 24 hr/day operation at maximum emission rate rate

Table 3 is a summary of the maximum facility toxic air contaminant (TAC) emissions from new sources. These emissions are used as input data for air pollutant dispersion models used to assess the increased health risk to the public resulting from the project. The ammonia emissions shown are based upon a worst-case ammonia emission concentration of 10 ppmvd @ 15% O_2 due to ammonia slip from the A-2, A-4, A-6, and A-8 SCR Systems. The risk screening trigger levels shown are per the District Toxic Risk Management Policy.

Table 3
Maximum Facility Toxic Air Contaminant (TAC) Emissions

Toxic Air Contaminant	Total Project Emissions[a] (lb/yr)	Risk Screening Trigger Level (lb/yr-project)
Acetaldehyde	1,400.8	72
Acrolein	131.3	3.9
Ammonia	821,750	19,300
Benzene	293.9	6.7
1,3-Butadiene	2.61	1.1
Ethylbenzene	372.7	193,000
Formaldehyde	2,325.8	33
Hexane	5,320.3	83,000
Naphthalene	33.92	270
Total PAHs (Aux. Boiler)	0.04	0.044
Individual PAHs (Gas Turbines and HRSGs)		
Anthracene	2	0.044
Benzo(a)anthracene	1.35	0.044
Benzo(a)pyrene	0.84	0.044
Benzo(b)fluoranthrene	0.69	0.044
Benzo(k)fluoranthrene	0.66	0.044
Chrysene	1.5	0.044
Dibenzo(a,h)anthracene	1.41	0.044
Indeno(1,2,3-cd)pyrene	1.41	0.044
Propylene	15,742.5	none specified
Propylene Oxide	974	52
Toluene	1,449.1	38,600
Xylenes	534.3	57,900
Arsenic	0.1	0.024
Cadmium	0.05	0.046
Trivalent chromium	0.84	0.0014
Copper	0.2	463
Lead	0.14	29
Mercury	0.05	57.9
Nickel	0.5	96.5
Silver	0.5	none specified
Zinc	0.35	6,760
Diesel Exhaust Particulate	17	0.64

[a]total combined emissions for S-1, S-3, & S-5 Gas Turbines, S-2, S-4, & S-6 HRSGs, S-7 Auxiliary Boiler, S-8 Cooling Tower, S-9 Fire Pump Diesel Engine, and S-10 Emergency Generator

Table 4 is a summary of the maximum annual regulated air pollutant emissions for the facility from proposed permitted sources. Pursuant to the Prevention of Significant Deterioration (PSD) requirements of New Source Review (Regulation 2-2-304.1 and 2-2-305.1), a new major facility with maximum annual pollutant emissions in excess of any of the trigger levels shown must perform modeling to assess the net air quality impact of the proposed facility.

Table 4
Maximum Annual Facility Regulated Air Pollutant Emissions

Pollutant	Permitted Source Emissions[a,b] (tons/year)	PSD Trigger[c] (tons/year)
Nitrogen Oxides (as NO_2)	263[d]	100
Carbon Monoxide	793.58	100
Precursor Organic Compounds	73.7	N/A[e]
Particulate Matter (PM_{10})	148	100
Sulfur Dioxide	21.33	100

[a]emission increases from proposed gas turbines and heat recovery steam generators, auxiliary boiler, cooling tower, fire pump diesel engine, and natural-gas fired emergency generator

[b]Includes start-up emissions for gas turbines (52 total cold start-ups and 260 total hot start-ups per year per turbine)

[c]for a new major facility

[d]annual limit proposed by applicant based upon average NOx emission rate of 2.0 ppmvd @ 15% O_2 for gas turbines and HRSGs

[e]there is no PSD requirement for POC because the BAAQMD is designated as nonattainment for the federal 1-hour ambient air quality standard for ozone

IV Statement of Compliance

The following section summarizes the applicable District Rules and Regulations and describes how the proposed East Altamont Energy Center will comply with those requirements.

A. Regulation 2, Rule 2; New Source Review

The primary requirements of New Source Review that apply to the proposed EAEC facility are Section 2-2-301; “Best Available Control Technology Requirement”, Section 2-2-302; “Offset Requirements, Precursor Organic Compounds and Nitrogen Oxides, NSR”, and Section 2-2-404, “PSD Air Quality Analysis”.

1. Best Available Control Technology (BACT) Determinations

Pursuant to Regulation 2-2-206, BACT is defined as the more stringent of:

(a) "The most effective control device or technique which has been successfully utilized for the type of equipment comprising such a source; or

(b) The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or

(c) Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO, or

(d) The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.”

The type of BACT described in definitions (a) and (b) must have been demonstrated in practice and approved by a local Air Pollution Control District, CARB, or the EPA and is referred to as “BACT 2”. This type of BACT is termed "achieved in practice". The BACT category described in definition (c) is referred to as "technologically feasible/cost-effective" and it must be commercially available, demonstrated to be effective and reliable on a full-scale unit, and shown to be cost-effective on the basis of dollars per ton of pollutant abated. This is referred to as “BACT 1”. BACT specifications (for both the "achieved in practice" and “technologically feasible/cost-effective" categories) for various source categories have been compiled in the BAAQMD BACT Guideline.

Gas Turbines, HRSGs, and Auxiliary Boiler

The following section includes BACT determinations by pollutant for the gas turbines, HRSG duct burners, and auxiliary boiler of the proposed East Altamont Energy Center. Because each Gas Turbine and its associated HRSG will exhaust through a common stack and be subject to combined emission limitations, the BACT determinations will, in practice, apply to each Gas Turbine/HRSG power train as a combined unit.

Nitrogen Oxides (NO_x)

- Combustion Gas Turbines

  District BACT Guideline 89.1.6 specifies BACT 1 (technologically feasible/cost-effective) for NO_x for a combined cycle gas turbine with a rated output $\geq$ 50 MW as 2.0 ppmvd @ 15% O_2 averaged over three hours or 2.5 ppmvd @ 15% O_2 averaged over one hour, typically achieved through the use of Selective Catalytic Reduction (SCR) with ammonia injection in conjunction with dry low-NOx combustors. The SCAQMD BACT Guideline for gas turbines $\geq$ 3 MW specifies BACT 1 for NO_x as 2.5 ppmvd, @ 15% O_2 with an efficiency correction factor and an assumed averaging period of one hour. This BACT determination was based upon the demonstration of a SCONOX system on a 32 MW combined cycle, baseload turbine currently in operation in Vernon, California. The EPA has accepted this BACT determination as Federal LAER and further established a NO_x concentration of 2.0 ppmvd @ 15% O_2 averaged over three hours as equivalent to 2.5 ppmvd, @ 15% O_2, averaged over one hour.

  The applicant originally proposed that each combustion gas turbine meet a NO_x emission concentration limit of 2.5 ppmvd NO_x @ 15% O_2, averaged over one hour during all operating modes except gas turbine start-ups and shutdowns. This meets the current District BACT 1 determination and meets the EPA and ARB BACT determination for NO_x. Compliance with this emission limitation will be achieved through the use of dry low-NOx combustors which utilize "lean-premixed" combustion technology to reduce the formation of NO_x and CO. The NO_x emissions from the turbine and HRSG will be abated through the use of a selective catalytic reduction (SCR) system with ammonia injection. The NO_x emission concentration will be verified by a CEM located at the common stack for each gas turbine/HRSG power train.

  Based upon our review of CEM data for the ANP Blackstone power plant, a nominal 550-MW combined cycle facility, we have concluded that a NO_x emission concentration of 2.0 ppmvd, @ 15% O_2, averaged over one hour, has been established as "achieved-in-practice" BACT for NO_x. The ANP Blackstone power plant is located in Blackstone, Massachusetts and consists of two ABB GT-4 Gas Turbines rated at 180-MW each with unfired heat recovery steam generators. We reviewed CEM data for approximately 2,313 firing hours for unit 1 and 2,737 firing hours for unit 2 which occurred from April 2001 to April 2002. With the exception of start-up and shutdown periods, the NOx concentrations were below the 2.0 ppmvd limit by a sufficient margin to demonstrate consistent, continuous compliance. The applicant has revised the application to meet this NO_x limit of 2.0 ppmvd @ 15% O_2, averaged over one hour. Accordingly, a NO_x limit of 2.0 ppmvd @ 15% O_2, averaged over one hour will be imposed as a permit condition.

- Heat Recovery Steam Generators (HRSGs)

  Supplemental heat will be supplied to the HRSGs with dry low-NO_x duct burners, which are designed to minimize NO_x emissions. The duct burner exhaust gases will also be abated by the SCR system with ammonia injection and when combined with the gas turbine exhaust, will achieve NO_x emission concentrations of less than or equal to 2.0 ppmvd @ 15% O_2, averaged over one hour.

- Auxiliary Boiler

  District BACT Guideline 17.3.1 specifies BACT 1 (achieved in practice) for NO_x for a boiler with a rated heat input $\geq$ 50 MM BTU/hr as a NO_x emission concentration of 9 ppmvd @ 3% O_2. The proposed S-7 Auxiliary Boiler is designed to achieve this NO_x emission level through the use of dry low-NO_x combustors and abatement by A-8 Selective Catalytic Reduction System with ammonia injection.

Top-Down BACT Analysis

The following "top-down" BACT analysis for NO_x has been prepared in accordance with EPA's 1990 Draft New Source Review Workshop Manual. A "top-down" BACT analysis takes into account energy, environmental, economic, and other costs associated with each alternative technology, and the benefit of reduced emissions that the technology would bring.

Available Control Options and Technical Feasibility

In a March 24, 2000 letter sent to local air pollution control districts, EPA Region 9 stated that the SCONO$_x$ Catalytic Adsorption System should be included in any BACT/LAER analysis for combined cycle gas turbine power plant projects since it can achieve the BACT/LAER emission specification for NO_x of 2.5 ppmvd @ 15% O_2, averaged over one hour or 2.0 ppmvd @ 15% O_2, averaged over three hours. In this letter, EPA stated that ABB Alstom Power, the exclusive licensee for SCONO$_x$ applications, has conducted "full-scale damper testing" that demonstrates that SCONO$_x$ is technically feasible for gas turbines of the size proposed for the East Altamont Energy Center. Stone & Webster Management Consultants, Inc. of Denver, Colorado was subsequently hired by ABB to conduct an independent technical review of the SCONO$_x$ technology as well as the full-scale damper testing program. According to the report by Stone & Webster, modifications to the actuators, fiberglass seals, and louver shaft-seal interface are being incorporated to resolve unacceptable reliability and leakage problems. However, no subsequent testing of the redesigned components has occurred to determine if the problems have been solved. Because the feasibility of the "scale-up" of the SCONO$_x$ system for large turbines has not been demonstrated, we do not consider SCONO$_x$ to be a viable control alternative for NO_x.

Although we do not consider SCONOx to be a technically feasible control alternative for this project, we have analyzed the collateral impacts of both SCR and $SCONO_x$. We are providing the following analysis for informational purposes only. The analysis shown in Table 5 applies to a single GE Frame 7FA or 7FB Gas Turbine equipped with DLN combustors and an unabated NO_x emission rate of 25 ppmvd @ 15% O_2.

Table 5 Top-Down BACT Analysis Summary for NO_x

Control Alternative	Emissions[a] (ton/yr)	Emission Reduction[b] (ton/yr)	Total Annualized Cost[c] ($/yr)	Average Cost-Effectiveness ($/ton)	Incremental Cost-Effectiveness ($/ton)	Toxic Impacts	Adverse Environmental Impacts	Incremental Energy Impact (MM BTU/yr)
$SCONO_x$	788	709	4,122,889	5,815	N/A[d]	No	No	122,000[e]
SCR	788	709	1,557,125	2,196	-	Yes	No	67,900[e]

[a]based upon unabated NO_x emission rate of 25 ppmvd @ 15% O_2, and annual firing rate of 17,436,780 MM BTU/yr

[b]based upon NO_x emission rate after abatement of 2.5 ppmvd @ 15% O_2, and annual firing rate of 17,436,780 MM BTU/yr

[c]"Cost Analysis for NO_x Control Alternatives for Stationary Gas Turbines", ONSITE SYCOM Energy Corporation, October 15, 1999

[d]does not apply since there is no difference in emission reduction quantity between alternatives

[e]"Towantic Energy Project Revised BACT Analysis", RW Beck, February 18, 2000; based upon increased fuel use to overcome catalyst bed back pressure

Energy Impacts

As shown in Table 5, the use of SCR does not result in any significant or unusual energy penalties or benefits when compared to $SCONO_x$. Although the operation and maintenance of $SCONO_x$ does result in a greater energy penalty when compared to that of SCR, this is not considered significant enough to eliminate $SCONO_x$ as a control alternative.

Economic Impacts

According to EPA's 1990 Draft New Source Review Workshop Manual, "Average and incremental cost effectiveness are the two economic criteria that are considered in the BACT analysis."

As shown in Table 5, the average cost-effectiveness of both SCR and $SCONO_x$ meet the current District cost-effectiveness guideline of $17,500 per ton of NO_x abated. However, the average cost-effectiveness of SCR is approximately 38% of the average cost-effectiveness of $SCONO_x$. These figures are based upon total annualized cost figures from a cost analysis conducted by ONSITE SYCOM Energy Corporation. Although SCONOx will result in greater economic impact as quantified by average cost-effectiveness, this impact is not considered adverse enough to eliminate $SCONO_x$ as a control alternative. See Appendix F for ONSITE SYSCOM cost-effectiveness calculations.

Incremental cost-effectiveness does not apply since SCR and $SCONO_x$ both achieve the former BACT/LAER standard for NO_x of 2.5 ppmvd @ 15% O_2, averaged over one hour and therefore achieve the same NO_x emission reduction in tons per year.

Environmental Impacts

The use of SCR will result in ammonia emissions due to an allowable ammonia slip limit of 10 ppmvd @ 15% O_2. A health risk assessment using air dispersion modeling showed an acute hazard index of 0.018 and a chronic hazard index of 0.0131 resulting from an ammonia slip limit of 10 ppmv @ 15% O_2. In accordance with the District Toxic Risk Management Policy and currently accepted practice, a hazard index of 1.0 or above is considered significant. Therefore, the toxic impact of the ammonia slip resulting from the use of SCR is deemed to be not significant and is not a sufficient reason to eliminate SCR as a control alternative.

The ammonia emissions resulting from the use of SCR may have another environmental impact through its potential to form secondary particulate matter such as ammonium nitrate. Because of the complex nature of the chemical reactions and dynamics involved in the formation of secondary particulates, it is difficult to estimate the amount of secondary particulate matter that will be formed from the emission of a given amount of ammonia. However, it is the opinion of the Research and Modeling section of the BAAQMD Planning Division that the formation of ammonium nitrate in the Bay Area air basin is limited by the formation of nitric acid and not driven by the amount of ammonia in the atmosphere. Therefore, ammonia emissions from the proposed SCR system are not expected to contribute significantly to the formation of secondary particulate matter within the BAAQMD. The potential impact on the formation of secondary particulate matter in the SJVAPCD is not known. This potential environmental impact is not considered adverse enough to justify the elimination of SCR as a control alternative.

A second potential environmental impact that may result from the use of SCR involves the storage and transport of anhydrous ammonia. Although ammonia is toxic if swallowed or inhaled and can irritate or burn the skin, eyes, nose, or throat, it is a commonly used material that is typically handled safely and without incident. The EAEC will be required to maintain a Risk Management Plan (RMP) and implement a Risk Management Program to prevent accidental releases. The RMP provides information on the hazards of the substance handled at the facility and the programs in place to prevent and respond to accidental releases. The accident prevention and emergency response requirements reflect existing safety regulations and sound industry safety codes and standards. In addition, the CEC has modeled the health impacts arising from a catastrophic release of ammonia due to spontaneous storage tank failure at the proposed EAEC facility and found that the impact would not be significant. Therefore, the potential enivronmental impact due to anhydrous ammonia storage at the EAEC does not justify the elimination of SCR as a control alternative.

The use of SCONOx will require approximately 360,000 gallons of water per year for catalyst cleaning. This environmental impact does not justify the elimination of $SCONO_x$ as a control alternative.

Conclusion

Because both SCR and $SCONO_x$ can achieve the NO_x emission limit of 2.5 ppmvd @ 15% O_2, averaged over one hour or 2.0 ppmvd @ 15% O_2, averaged over three hours and neither will cause significant energy, economic, or environmental impacts, neither can be eliminated as viable control alternatives. The only aspect of this analysis affected by the current NOx standard of 2.0 ppmvd @ 15% O_2, averaged over one hour is the cost of compliance. The increased cost is not expected to affect the conclusion of this analysis. Therefore, the applicant's proposed use of SCR to meet the NO_x BACT/LAER specification is acceptable.

Carbon Monoxide (CO)

BACT for CO will be analyzed within the context of three distinct operating modes for each gas turbine/HRSG power train. The first mode is firing of the gas turbine only over its entire operating range from minimum to maximum load. The second mode includes gas turbine firing at maximum load with HRSG duct burner firing. The third mode includes gas turbine firing at maximum load with HRSG duct burner firing and steam injection power augmentation at the gas turbine combustors. In principal, steam injection power augmentation lowers the post-combustor flame temperature (allowing an increased fuel use rate) and increases mass flow through the turbine blades, which in turn increases gas turbine peak generating capacity during periods of high ambient temperature.

- Combustion Gas Turbines and Heat Recovery Steam Generators (HRSGs)

  District BACT Guideline 89.1.6 specifies BACT 2 (achieved in practice) for CO for combined cycle gas turbines with a rated output of $\geq$ 50 MW as a CO emission concentration of $\leq$ 4.0 ppmvd @ 15% O_2. This BACT specification is based upon the Sacramento Power Authority (Campbell Soup facility) located in Sacramento County, California. BACT 1 (technologically feasible/cost-effective) is currently not specified. This emission rate limit applies to all operating modes except gas turbine start-up and shutdown.

  The applicant has agreed to a CO emission limit of 4.0 ppmvd @ 15% O_2, averaged over any rolling 3-hour period. This satisfies the current BACT 2 limitation as discussed above. Compliance with this emission limitation will be achieved through the use of dry low-NOx combustors which utilize "lean-premixed" combustion technology to reduce the formation of NO_x and CO. CO emissions from the turbine and HRSG will be abated through the use of an oxidation catalyst. The CO emission concentration will be verified by a CEM located at the common stack for each gas turbine/HRSG power train.

- Auxiliary Boiler

  With highest-day CO emissions of 120 pounds, S-7 Auxiliary Boiler triggers the BACT requirement of New Source Review (District Regulation 2, Rule 2) for carbon monoxide. BAAQMD BACT Guideline 17.3.1 specifies BACT for CO for boilers with a rated heat input ≥ 50 MM BTU/hr as a CO emission concentration of 50 ppmvd @ 3% O_2. The proposed S-7 Auxiliary Boiler will be limited by permit condition to a CO emission concentration of 50 ppmvd @ 3% O_2, averaged over any consecutive three hour period. The auxiliary boiler will achieve this CO emission level through the use of dry low-NO_x burners, good combustion practices and an oxidation catalyst.

Precursor Organic Compounds (POCs)

- Combustion Gas Turbines

  Currently, District BACT Guideline 89.1.6 specifies BACT 2 (achieved in practice) for POC for combined cycle gas turbines with an output rating ≥ 50 MW as 2 ppmv, dry @ 15% O_2, which is typically achieved through the use of dry-low NOx combustors and/or an oxidation catalyst. There currently is no BACT 1 (technologically feasible/cost-effective) specification for CO for this category of source. This is based upon the Delta Energy Center and Metcalf Energy Center, which were recently permitted at a POC emission limit of 2 ppmvd @ 15% O_2.

  The applicant has proposed a combined POC emission limitation of 6.64 pounds per hour and 0.00252 lb/MM BTU that are equivalent to an emission concentration of 2 ppmvd @ 15% O_2. This limit applies to the combined exhaust from each gas turbine and corresponding HRSG duct burners. This meets the current BACT 1 specification for POC. Each gas turbine/HRSG pair will achieve this emission limitation through the use of dry low-NO_x burners, good combustion practices and an oxidation catalyst.

- Heat Recovery Steam Generators (HRSGs)

  The HRSG duct burners will be of dry, low-NO_x design, which minimizes incomplete combustion and therefore the POC emission rate. As stated above, the applicant has proposed a combined POC emission concentration limit of 2.0 ppmvd @ 15% O_2 for simultaneous firing of the turbine and HRSG duct burners. This meets the current BACT 1 specification for POC. Each gas turbine/HRSG pair will achieve this emission limitation through the use of dry low-NO_x burners, good combustion practices and an oxidation catalyst.

- Auxiliary Boiler

  With worst-case daily POC emissions in excess of 10 pounds, the proposed S-7 Auxiliary Boiler triggers the BACT requirement of New Source Review (District Regulation 2-2-301) for POC. Current BACT Guideline 17.3.1, which applies to boilers with a heat input of ≥ 50 MM BTU/hr, specifies BACT for POC as good combustion practices. As stated earlier, the auxiliary boilers will utilize low-NO_x burners that are also designed to minimize incomplete combustion and therefore minimize POC emissions.

The auxiliary boiler will also be abated by an oxidation catalyst. However, as a conservative assumption, the applicant has assumed no POC reduction for the oxidation catalyst. The design specifications for the auxiliary boiler specifies a maximum POC emission rate of 0.6 lb/hr at full load. This is equivalent to an emission factor of 0.0044 lb/MM BTU and an emission concentration of 10.5 ppmvd @ 3% O_2.

Sulfur Dioxide (SO_2)

- Combustion Gas Turbines

  District BACT Guideline 89.1.6 specifies BACT 2 (achieved in practice) for SO_2 for combined cycle gas turbines with an output rating of $\geq$ 50 MW as the exclusive use of clean-burning natural gas with a sulfur content of $\leq$ 1.0 grains per 100 scf. The proposed turbines will burn exclusively PUC-regulated natural gas with an expected average sulfur content of 0.25 grains per 100 scf, which will result in minimal SO_2 emissions. This corresponds to an SO_2 emission factor of 0.0007 lb/MM BTU. This meets the current BACT 2 specification for SO_2.

- Heat Recovery Steam Generators (HRSGs)

  As is the case for the Gas Turbines, BACT for SO_2 for the HRSG duct burners is the exclusive use of clean-burning natural gas with a sulfur content of $\leq$ 1.0 grains per 100 scf. The HRSGs will burn exclusively PUC-regulated natural gas with an average natural gas sulfur content of 0.25 grains per 100 scf. This corresponds to an SO_2 emission factor of 0.0007 lb/MM BTU. This meets the current BACT 2 specification for SO_2.

- Auxiliary Boiler

  District BACT Guideline 17.3.1 specifies BACT for SO_2 for a boiler with a heat input of $\geq$ 50 MM BTU/hr as the exclusive use of clean-burning natural gas. As is the case for the Gas Turbines and HRSGs, the auxiliary boiler will burn exclusively PUC-regulated natural gas with an average natural gas sulfur content of 0.25 grains per 100 scf. This meets the current BACT specification for SO_2.

Particulate Matter (PM_{10})

- Combustion Gas Turbines

  District BACT Guideline 89.1.6 specifies BACT for PM_{10} for combined cycle gas turbines with rated output of $\geq$ 50 MW as the exclusive use of clean-burning natural gas with a maximum sulfur content of $\leq$ 1.0 grains per 100 scf. The proposed turbines will utilize exclusively PUC-regulated natural gas with an average sulfur content of 0.25 gr/100 scf, which will result in minimal direct PM_{10} emissions and minimal formation of secondary PM_{10} such as ammonium sulfate.

- Heat Recovery Steam Generators (HRSGs)

  BACT for PM_{10} for the HRSG duct burners is the exclusive use of clean-burning natural gas with a maximum sulfur content of $\leq$ 1.0 grains per 100 scf. The HRSGs will burn exclusively PUC-regulated natural gas with an average natural gas sulfur content of 0.25 grains per 100 scf which will result in minimal direct PM_{10} emissions and minimal formation of secondary PM_{10} such as ammonium sulfate.

- Auxiliary Boiler

  District BACT Guideline 17.3.1 specifies BACT for PM_{10} for a boiler with a heat input of $\geq$ 50 MM BTU/hr as the exclusive use of clean-burning natural gas. As is the case for the Gas Turbines and HRSGs, the proposed auxiliary boiler will burn exclusively PUC-regulated natural gas with an average natural gas sulfur content of 0.25 grains per 100 scf which will result in minimal direct PM_{10} emissions and minimal formation of secondary PM_{10} such as ammonium sulfate.

Cooling Tower

As shown in Table 2, the proposed S-8 Cooling Tower has highest daily PM_{10} emissions in excess of 10 pounds and therefore triggers the BACT requirement of NSR. The BAAQMD BACT/TBACT workbook does not specify BACT for PM_{10} for wet cooling towers. However, the ARB BACT Clearinghouse cites a BACT specification for PM_{10} for the proposed La Paloma power plant cooling tower as the use of drift eliminators with a maximum drift rate of 0.0006%. The cooling towers for the Los Medanos Energy Center, Delta Energy Center, and Metcalf Energy Center will be equipped with drift eliminators with a guaranteed drift rate of 0.0005%.

The proposed S-8 Cooling Tower will also be equipped with drift eliminators with a guaranteed drift rate of 0.0005%. This specification will satisfy BACT for PM_{10}.

Fire Pump Diesel Engine

Based upon 24 hour per day operation under emergency conditions, the proposed fire pump diesel engine triggers BACT for NO_x and CO, since its potential to emit for each of those pollutants exceeds 10 pounds per day. The current District BACT limits and the specifications for the proposed engine are summarized in Table 6. As shown, the proposed engine satisfies BACT for all pollutants listed.

Table 6 District BACT Limits and Proposed Fire Pump Diesel Engine Specifications

Pollutant	District BACT Specifications[a] (g/bhp-hr)	Engine[b] CARB-Certification Specifications (g/bhp-hr)
NOx	6.9	6
CO	2.75	1
POC	1.5	0.4
PM_{10}	0.15	0.15

[a]BACT 2 ("achieved in practice") per District BACT Guideline 96.1.2, "IC Engine – Compression Ignition $\geq$ 275 hp output rating"

[b]Clarke Model JDFP-06WR, 300bhp

Emergency Generator (natural gas fired)

Based upon 24 hour per day operation under emergency conditions, the proposed natural gas fired emergency generator triggers BACT for NO_x, CO, and POC. The current District BACT limits and the specifications for the proposed engine are summarized in Table 7. As shown, the proposed engine satisfies BACT for CO, NO_x, and POC.

Table 7 District BACT Limits and Proposed Emergency Generator Engine Specifications

Pollutant	District BACT Specifications[a] (g/bhp-hr)	Engine[b] Mfg. Specifications (g/bhp-hr)
NO_x	1.0	0.82
CO	2.75	2.6
POC	1.0	0.44

[a]BACT 2 ("achieved in practice") per District BACT Guideline 96.3.1, "IC Engine – Spark Ignition, Natural gas, $\geq$ 250 hp output rating"

[b]Cummins Model QSV81, 1529 bhp, lean-burn

2. Emission Offsets

General Requirements

Pursuant to Regulation 2-2-302, federally enforceable emission offsets are required for POC and NO_x emission increases from permitted sources at facilities which will emit 15 tons per year or more on a pollutant-specific basis. For facilities that will emit more than 50 tons per year of

NO_x, offsets must be provided by the applicant at a ratio of 1.15 to 1.0. Pursuant to Regulation 2-2-302.2, POC offsets may be used to offset emission increases of NO_x.

Pursuant to Regulation 2-2-303, emission offsets shall be provided (at a ratio of 1.0:1.0) for PM_{10} emission increases at new facilities that will be permitted to emit more than 100 tons of PM_{10} per year. Pursuant to Regulation 2-2-303.1, emission reduction credits of nitrogen oxides or sulfur dioxide may be used to offset PM_{10} emission increases at offset ratios determined by the APCO to result in a net air quality benefit. This determination is based upon a case-by-case analysis that includes modeling, public notice, opportunity for public comment, and USEPA concurrance. The location of the NO_x or SO_2 offsets relative to the proposed location of the facility (and resulting PM_{10} emission increase) is considered when determining the acceptability of the offsets.

It should be noted that in the case of POC and NO_x offsets, District regulations do not require consideration of the location of the source of the emission reduction credits relative to the location of the proposed emission increases that will be offset.

Timing for Provision of Offsets

Pursuant to District Regulation 2-2-311, the applicant must provide the required valid emission reduction credits to mitigate the emission increases for the facility prior to the issuance of the Authority to Construct. Pursuant to District Regulation 2, Rule 3, "Power Plants," the Authority to Construct will be issued after the California Energy Commission issues the Certificate for the proposed power plant.

Offset Requirements by Pollutant

The applicable offset ratios and the quantity of offsets required are summarized in Appendix C, Table C-1.

POC Offsets

Because the East Altamont Energy Center will emit greater than 50 tons of POC per year, the POC emissions must be offset at a ratio of 1.15 to 1.0 pursuant to District Regulation 2-2-302.

NO_x Offsets

Because the East Altamont Energy Center will emit greater than 50 tons per year of Nitrogen Oxides (NO_x) from permitted sources, the applicant must provide emission reduction credits (ERCs) of NO_x at a ratio of 1.15 to 1.0 pursuant to District Regulation 2-2-302. Pursuant to District Regulation, 2-2-302.2, the applicant has the option to provide POC ERCs to offset the proposed NO_x emission increases at a ratio of 1.15 to 1.0.

PM_{10} Offsets

With projected PM_{10} emissions from permitted sources in excess of 100 tons per year, the East Altamont Energy Center triggers the PM_{10} offset requirement of District Regulation 2-2-303. Pursuant to District Regulation 2-2-303.1, the applicant has proposed using SO_2 emission reduction credits to offset the PM_{10} emission increases at a ratio of 2.0:1.0. The proposed offsets were generated from SO_2 emission reductions that occurred in the city of Rodeo, California. The District has reviewed the proposal, and has determined that an offset ratio of 3.0:1.0 is required to demonstrate a net air quality benefit. This determination is subject to public notice and opportunity for public comment and USEPA review and concurrence. The public comment period ran concurrently with the comment period for the PDOC and closed on May 17, 2002. The District has submitted its analysis to USEPA for review and concurrence. The authority to construct for the proposed facility may not be issued until sufficient PM_{10} offsets (or interpollutant equivalent offsets) have been approved and provided by the applicant.

SO_2 Offsets

Pursuant to Regulation 2-2-303, emission reduction credits are not required for the proposed SO_2 emission increases associated with this project since the facility SO_2 emissions will not exceed 100 tons per year. Regulation 2-2-303 allows for the voluntary offsetting of SO_2 emission increases of less than 100 tons per year. The applicant has opted not to provide such emission offsets.

Offset Package

Table 8 summarizes the current offset obligation of the East Altamont Energy Center and the quantity of valid emission reduction credits (ERCs) under the control of Calpine. The emission reduction credits presented in Table 5 exist as federally-enforceable, banked emission reduction credits that have been reviewed for compliance with District Regulation 2, Rule 4, "Emissions Banking", and were subsequently issued as banking certificates by the BAAQMD under the applications cited in the table footnotes. If the quantity of offsets issued under any certificate exceeded 40 tons per year for any pollutant, the application was subject to the public notice and public comment requirements of District Regulation 2-4-405. Accordingly, such applications were reviewed by the California Air Resources Board, U.S. EPA, and adjacent air pollution control districts to insure that all applicable federal, state, and local regulations were satisfied.

As indicated below, Calpine currently owns sufficient valid emission reduction credits to offset the emission increases from the permitted sources proposed for the East Altamont Energy Center. Although the applicant has proposed providing SO_2 offsets to mitigate the PM_{10} emission increase for the EAEC at a ratio of 2.0:1.0, they have secured sufficient SO_2 offsets to meet a 3.0:1.0 ratio which may apply if deemed necessary by the District.

Table 8
Emission Reduction Credits Identified by Calpine as of December 13, 2001 (ton/yr)

Valid Emission Reduction Credits	POC	NO_x	SO_2	PM_{10}
Certificate number, Owner, Reduction Location				
Banking Certificate 645, Calpine, San Leandro[a]	0	107.900	0	0
Banking Certificate 716, Calpine, Redwood City[b]	0.200	11.660	0.04	0.670
Banking Certificate 687, Calpine/Bechtel, San Leandro[c]	43.819	0.581	0	0
Banking Certificate 602, Calpine/Bechtel, Oakland[d]	40.970	2.143	0	0
Banking Certificate 749, Calpine/Bechtel, Antioch[e]	0	13.670	0	0
Banking Certificate 661, Calpine, San Jose[f]	31.750	0	0	0
Banking Certificate 662, Calpine, Oakland[g]	0	73.620	46.300	0
Banking Certificate 741, Calpine/Bechtel, Rodeo[h]	0	96.813	436.470	0
Total ERC's Identified	116.739	306.387	482.810	0.670
Permitted Source Emission Limits	73.7	263	21.33	148
Offsets Required per BAAQMD Calculations	84.755[i]	302.450[i]	0	148
Proposed Interpollutant offset of SO_2 for PM_{10} at 3:1 ratio	---	---	441.990	147.330
Outstanding Offset Balance	**31.984**	**3.937**	**40.82**	**0**

[a]application 7793, Latchford Glass Company, issued 6/04/92, original certificate #202

[b]application 30044, S&W Fine Foods, issued 5/12/81, original certificate #12

[c]application 18308, James River Corporation, issued 6/09/99, original certificate #574

[d]application 32613, Del Monte Foods, issued 9/29/87, original certificate #82

[e]application 18833, Owens Brockway Glass, issued 6/10/99, original certificate #590

[f]application 18791, Quebecor, issued 6/02/99, original certificate #589

[g]application 12230, Owens Brockway Glass, issued 1/05/95, original certificate #330

[h]application 1388, Pacific Gas & Electric, issued 1/05/89, original certificate #100

[i]reflects applicable offset ratio of 1.15:1.0 pursuant to Regulation 2-2-302.2

[j]pursuant to District Regulation, 2-2-303.1, the applicant will provide SO_2 ERCs to offset the PM_{10} offset obligation

3. PSD Air Quality Impact Analysis

Pursuant to BAAQMD Regulation 2-2-414.1, the applicant has submitted a modeling analysis that adequately estimates the air quality impacts of the EAEC project. The applicant's analysis was based on EPA-approved models and was performed in accordance with District Regulation 2-2-414.

Pursuant to Regulation 2-2-414.2, the District has found that the modeling analysis has demonstrated that the allowable emission increases from the EAEC facility, in conjunction with all other applicable emissions, will not cause or contribute to a violation of applicable ambient air quality standards for NO_2, CO, and PM_{10} or an exceedance of any applicable PSD increment.

Pursuant to Regulation 2-2-417, the applicant has submitted an analysis of the impact of the proposed source and source-related growth on visibility, soils, and vegetation. The entire PSD air quality impact analysis is contained in Appendix E.

Pursuant to Regulation 2-2-306, a non-criteria pollutant PSD analysis is required for sulfuric acid mist emissions if the proposed facility will emit H_2SO_4 at rates in excess of 38 lb/day and 7 tons per year. However, EAEC has accepted permit conditions limiting total facility H_2SO_4 emissions to 7 tons per year and requiring annual source testing to determine SO_2, SO_3, and H_2SO_4 emissions. If the 7-tons-per-year limit is ever exceeded, the District will take appropriate enforcement action, and the applicant must utilize air dispersion modeling to determine the impact (in $\mu g/m^3$) of the sulfuric acid mist emissions.

Table 9 Maximum Predicted Ambient Impacts of Proposed EAEC ($\mu g/m^3$)
[maximums are in bold type]

Pollutant	Averaging Time	Commissioning Maximum Impact	Start-up (1-hour)	Inversion Break-up Fumigation Impact	ISCST3 Modeled Impact	Significant Air Quality Impact Level
NO_2	1-hour	127	104	64	**236**	19
	annual	—	—	—	**0.56**	1.0
CO	1-hour	606	**606**	73	582	2000
	8-hour	—	—	—	**169**	500
PM_{10}	24-hour	—	—	2.0	**4.97**	5
	annual	—	—	—	**0.46**	1

Because the maximum modeled project impacts for annual average NO_2, 1-hour & 8-hour average CO, and 24-hour & annual average PM_{10} did not exceed their corresponding significance levels for air quality impacts per Regulation 2-2-233, further analysis to determine if the corresponding ambient air quality standards will be exceeded per District regulation 2-2-414 is not required. Table 10 summarizes the applicable ambient air quality standards, the maximum background concentrations, and the contribution from the proposed EAEC.

Table 10
California and National Ambient Air Quality Standards (AAQS) and Ambient Air Quality Levels from the Proposed EAEC ($\mu g/m^3$)

Pollutant	Averaging Time	Maximum Background	Maximum Project impact	Maximum Project impact plus maximum background	California Standards	National Standards
NO_2	1-hour	149	236	385	470	---

B. Health Risk Assessment

Pursuant to the BAAQMD Risk Management Policy, a health risk screening must be conducted to determine the potential impact on public health resulting from the worst-case emissions of toxic air contaminants (TACs) from the EAEC project. The potential TAC emissions (both carcinogenic and non-carcinogenic) from the EAEC are summarized in Table 2. In accordance with the requirements of the BAAQMD Toxic Risk Management Policy (TRMP) and CAPCOA guidelines, the impact on public health due to the emission of these compounds was assessed utilizing approved air pollutant dispersion models.

Table 11 Health Risk Assessment Results

Sources	Multi-pathway Carcinogenic Risk (risk in one million)	Chronic Hazard Index	Acute Hazard Index[a]
Gas Turbines, HRSGs, Auxiliary Boiler, Emergency Generator, and Cooling Tower[b]	0.178	--	--
Fire Pump Diesel Engine	0.913	--	--
Maximum Facility Risk:	0.937[c]	0.008	0.378

[a]included for informational purposes only; BAAQMD TRMP does not require an assessment of acute (short-term; i.e. < 24 hour) health impacts

[b]numbers represent combined risk from all sources

[c]because the location of maximum impact for the diesel engine does not coincide with the locations of maximum impact for the other sources, the carcinogenic risk numbers do not add directly to determine the maximum facility cancer risk shown

The health risk assessment performed by the applicant has been reviewed by the District Toxics Evaluation Section and found to be in accordance with guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA), the California Air Resources Board (CARB), and the California Air Pollution Control Officers Association (CAPCOA). Pursuant to the BAAQMD Risk Management Policy, the increased carcinogenic risk attributed to this project is considered to be not significant since it is less than 1.0 in one million. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered to be not significant since it is less than 1.0. Therefore, the EAEC facility is deemed to be in compliance with the BAAQMD Toxic Risk Management Policy. Please see Appendix D for further discussion.

C. Other Applicable District Rules and Regulations

Regulation 1, Section 301: Public Nuisance

None of the project's proposed sources of air contaminants are expected to cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public with respect to any impacts resulting from the emission of air contaminants regulated by the District. In part, the PSD air quality impact analysis insures that the proposed facility will comply with this Regulation by concluding that the East Altamont Energy Center will not interfere with the attainment or maintenance of applicable federal or state health-based ambient air quality standards for NO_2, CO and PM_{10}.

Regulation 2, Rule 1, Sections 301 and 302:
Authority to Construct and Permit to Operate

Pursuant to Regulation 2-1-301 and 2-1-302, the East Altamont Energy Center has submitted an application to the District to obtain an Authority to Construct and Permit to Operate for the proposed S-1, S-3, & S-5 Gas Turbines, S-2, S-4, & S-6 Heat Recovery Steam Generators, S-7 Auxiliary Boiler, S-8 Cooling Tower, S-9 Fire Pump Diesel Engine, and S-10 Emergency Generator.

Regulation 2, Rule 1, Sections 426: CEQA-Related Information Requirements

As the lead agency under CEQA for the proposed East Altamont Energy Center, the California Energy Commission (CEC) will satisfy the CEQA requirements of Regulation 2-1-426.2.1 by producing their Certification which serves as an EIR-equivalent pursuant to the CEC's CEQA-certified regulatory program in accordance with CEQA Guidelines Section 15253(b) and Public Resource Code Sections 21080.5 and 25523.

Regulation 2, Rule 2, Section 307: Denial, Failure of all Facilities to be in Compliance

Pursuant to Regulation 2-2-307, Calpine Corporation has provided a list of all major facilities within the state of California owned or operated by Calpine Corporation or by any entity controlling, controlled by, or under common control with Calpine Corporation and certified under penalty of perjury that these major facilities are in compliance with all applicable state and federal emission limitations and standards.

Regulation 2, Rule 3: Power Plants

Pursuant to Regulation 2-3-405, this Final Determination of Compliance (FDOC) serves as the APCO's final determination that the proposed power plant will meet the requirements of all applicable BAAQMD, state, and federal regulations. The FDOC contains proposed permit conditions to ensure compliance with those regulations. Pursuant to Regulation 2-3-404, this FDOC has fulfilled the public notice, public comment, and public inspection requirements contained in Regulation 2-2-406 and 407. The Authority to Construct, when issued by the District, will be the PSD permit for the EAEC.

Regulation 2, Rule 6: Major Facility Review

Pursuant to Regulation 2, Rule 6, section 404.1, the owner/operator of the EAEC shall submit an application to the BAAQMD for a major facility review permit within 12 months after the facility becomes subject to Regulation 2, Rule 6. Pursuant to Regulation 2-6-212.1 and 2-6-218, the EAEC will become subject to Regulation 2, Rule 6 upon completion of construction as demonstrated by first firing of the gas turbines.

Regulation 2, Rule 7: Acid Rain

The East Altamont Energy Center gas turbine units, heat recovery steam generators, and auxiliary boiler will be subject to the requirements of Title IV of the federal Clean Air Act. The requirements of the Acid Rain Program are outlined in 40 CFR Part 72. The specifications for the type and operation of continuous emission monitors (CEMs) for pollutants that contribute to the formation of acid rain are set forth in 40 CFR Part 75. District Regulation 2, Rule 7 incorporates by reference the provisions of 40 CFR Part 72. Pursuant to 40 CFR Part 72.30(b)(2)(ii), EAEC must submit an Acid Rain Permit Application to the District at least 24 months prior to the date on which each unit commences operation. Pursuant to 40 CFR Part 72.2, "commence operation" includes the start-up of the unit's combustion chamber.

Regulation 6: Particulate Matter and Visible Emissions

Through the use of dry low-NO_x burner technology and proper combustion practices, the combustion of natural gas at the proposed gas turbines, HRSG duct burners, auxiliary boiler, and emergency generator is not expected to result in visible emissions. Specifically, the facility's combustion sources are expected to comply with Regulation 6, including sections 301 (Ringelmann No. 1 Limitation), 302 (Opacity Limitation) with visible emissions not to exceed 20% opacity, and 310 (Particulate Weight Limitation) with particulate matter emissions of less than 0.15 grains per dry standard cubic foot of exhaust gas volume. As calculated in accordance with Regulation 6-310.3, the grain loading resulting from the simultaneous operation of each power train (Gas Turbine and HRSG Duct Burners) is 0.0025 gr/dscf @ 6% O_2. The grain loading of the Auxiliary boiler is calculated to be 0.005 gr/dscf @ 6% O_2. See Appendix A for CTG/HRSG grain loading calculations.

With a maximum total dissolved solids content of 3400 mg/l and corresponding maximum PM_{10} emission rate of 2.4 lb/hr, the proposed 19-cell cooling tower is expected to comply with the requirements of Regulation 6.

Particulate matter emissions associated with the construction of the facility are exempt from District permit requirements but are subject to Regulation 6. It is expected that the conditions of certification imposed by the California Energy Commission will include requirements for construction activities that will require the use of water and/or chemical dust suppressants to minimize PM_{10} emissions and prevent visible particulate emissions.

Regulation 7: Odorous Substances

Regulation 7-302 prohibits the discharge of odorous substances which remain odorous beyond the facility property line after dilution with four parts odor-free air. Regulation 7-302 limits ammonia emissions to 5000 ppm. Because the ammonia slip emissions from the proposed CTG/HRSG power trains and auxiliary boiler will each be limited by permit condition to 10 ppmvd @ 15% O_2, the facility is expected to comply with the requirements of Regulation 7.

Regulation 8: Organic Compounds

The gas turbines, HRSGs, auxiliary boiler, and emergency generator are exempt from Regulation 8, Rule 2, "Miscellaneous Operations" per 8-2-110 since natural gas will be fired exclusively at those sources. The fire pump diesel engine will comply with Regulation 8-2-301 since its emissions will contain a total carbon concentration of less than 300 ppmv, dry.
The use of solvents for cleaning and maintenance at the EAEC is expected to comply with Regulation 8, Rule 4, "General Solvent and Surface Coating Operations" section 302.1 by emitting less than 5 tons per year of volatile organic compounds.

Regulation 9: Inorganic Gaseous Pollutants

Regulation 9, Rule 1, Sulfur Dioxide

This regulation establishes emission limits for sulfur dioxide from all sources and applies to the combustion sources at this facility. Section 301 (Limitations on Ground Level Concentrations) prohibits emissions which would result in ground level SO_2 concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Section 302 (General Emission Limitation) prohibits SO_2 emissions in excess of 300 ppmv (dry). With maximum projected SO_2 emissions of < 1 ppmv, the gas turbines, HRSG duct burners, and auxiliary boiler are not expected to cause ground level SO_2 concentrations in excess of the limits specified in Regulation 9-1-301 and should easily comply with section 302.

Regulation 9, Rule 3, Nitrogen Oxides from Heat Transfer Operations

The proposed combustion gas turbines (each rated at 1,898.8 MM BTU/hr, HHV) and HRSG duct burners (each rated at 732 MM BTU/hr, HHV) shall comply with the Regulation 9-3-303 NO_x limit of 125 ppm by complying with a permit condition nitrogen oxide emission limit of 2.5 ppmvd @ 15% O_2. The proposed emergency generator is not subject to this regulation since it has a maximum heat input rating of 11.6 MM BTU/hr. The proposed fire pump diesel engine is not subject to this regulation since it has a maximum heat input rating of 2.156 MM BTU/hr.

Regulation 9, Rule 7, Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

The proposed S-2, S-4, and S-6 HRSGs are subject to the emission concentration limits of Regulation 9, Rule 7, section 301 which limits NO_x emissions to 30 ppmv, dry @ 3% O_2 and CO emissions to 400 ppmv, dry @ 3% O_2. To determine if the HRSG duct burners comply with these NO_x emission limits, it would be necessary to install a NOx CEM upstream of the HRSG duct burners since the HRSGs and turbines exhaust through a common stack. Because the combined exhaust from the turbines and HRSGs are subject to a much more stringent BACT limit of 2.0 ppmvd @ 15% O_2, it is reasonable to conclude that the HRSG duct burners comply with the emission limits of Regulation 9, Rule 7. As a practical matter, the HRSG duct burners are therefore subject to Regulation 9, Rule 9.

Because the proposed S-7 Auxiliary Boiler will be subject to permit conditions limiting NO_x emissions to 9 ppmvd @ 15% O_2 and CO emissions to 50 ppmvd @ 15% O_2, they will comply with the Regulation 9-7-301 NO_x limit of 30 ppmvd @ 3% O_2 and CO limit of 400 ppmvd @ 3% O_2.

Regulation 9, Rule 8, Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

The proposed 300 hp fire pump diesel engine is exempt from the requirements of Regulation 9, Rule 8 per Regulation 9-8-110.2, since it will be fired exclusively on diesel fuel. The proposed emergency generator will comply with Regulation 9-8-301.2 ("Emission Limits – Fossil Derived Fuels, Lean-Burn Engines") and Regulation 9-8-301.3 ("CO Emission Limits").

Regulation 9, Rule 9, Nitrogen Oxides from Stationary Gas Turbines

Because each of the proposed combustion gas turbines will be limited by permit condition to NO_x emissions of 2.0 ppmvd @ 15% O_2, they will comply with the Regulation 9-9-301.3 NO_x limitation of 9 ppmvd @ 15% O_2.

Regulation 10: Standards of Performance for New Stationary Sources

Regulation 10 incorporates by reference the provisions of Title 40 CFR Part 60. The applicable subparts of 40 CFR 60 include Subpart A, "General Provisions", Subpart Da, "Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978", and Subpart GG "Standards of Performance for Stationary Gas

Turbines". The proposed gas turbines and heat recovery steam generators will comply with all applicable standards and limits prescribed by these regulations. The applicable emission limitations are summarized below:

Applicable New Source Performance Standards

Source	Requirement	Emission Limitation	Compliance Verification
Gas Turbines and HRSGs	Subpart Da		
	40 CFR 60.44a(a)(1)	0.2 lb NOx/MM BTU, except during start-up, shutdown, or malfunction	Sources limited by permit condition to 0.00904 lb/NOx/MM BTU
	40 CFR 60.44a(a)(2)	25% reduction of potential NOx emission concentration	SCR Systems will comply with this reduction requirement
	40 CFR 60.44a(d)(1)	1.6 lb NOx/MW-hr	0.065 lb NOx/MW-hr at nominal plant rating of 1100 MW
	Subpart GG		
	40 CFR 60.332(a)(1)	100 ppmv NOx, @ 15% O_2, dry	Sources limited by permit condition to 2.5 ppmv NOx @ 15% O_2, dry

V Permit Conditions

The following permit conditions will be imposed to ensure that the proposed project complies with all applicable District, State, and Federal Regulations. The conditions limit operational parameters such as fuel use, stack gas emission concentrations, and mass emission rates. Permit conditions will also specify abatement device operation and performance levels. To aid enforcement efforts, conditions specifying emission monitoring, source testing, and record keeping requirements are included. Furthermore, pollutant mass emission limits (in units of lb/hr and lb/MM BTU of natural gas fired) will insure that daily and annual emission rate limitations are not exceeded.

To provide maximum operational flexibility, no limitations will be imposed on the type, or quantity of gas turbine start-ups or shutdowns. Instead, the facility must comply with daily and annual (consecutive twelve-month) mass emission limits at all times. Compliance with CO and NO_x limitations will be verified by continuous emission monitors (CEMs) that will be in operation during all turbine operating modes, including start-up and shutdown. If the CO and NO_x CEMs are not capable of accurately assessing gas turbine start-up and shutdown mass emission rates due to variable O_2 content and the differing response times of the O_2 and NO_x monitors, then start-up and shutdown mass emission rates will be based upon annual source test results. Compliance with POC, SO_2, and PM_{10} mass emission limits will be verified by annual source testing.

In addition to permit conditions that apply to steady-state operation of each CTG/HRSG power train, conditions will be imposed that govern equipment operation during the initial commissioning period when the CTG/HRSG power trains will operate without their SCR systems in place and the auxiliary boilers will operate without their SCR systems and oxidation catalysts in place. Commissioning activities include, but are not limited to the testing of the gas turbines, adjustment of control systems, and the cleaning of the HRSG and auxiliary boiler steam tubes. Permit conditions 1 through 12 apply to this commissioning period and are intended to minimize emissions during the commissioning period and insure that those emissions will not contribute to the exceedance of any short-term applicable ambient air quality standard.

East Altamont Energy Center
Permit Conditions

(A) Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf
Rolling 3-hour period:	Any consecutive three-hour period, not including start-up or shutdown periods
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in minutes
MM BTU:	million british thermal units
Gas Turbine Start-up Mode:	The lesser of the first 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 25(b) and 25(d)
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 25(b) through 25(d) until termination of fuel flow to the Gas Turbine
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be considered to be Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene

Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission points P-1 (combined exhaust of S-1 Gas Turbine and S-2 HRSG duct burner) P-2 (combined exhaust of S-3 Gas Turbine and S-4 HRSG duct burner), and P-3 (combined exhaust of S-5 Gas Turbine and S-6 HRSG duct burner), the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis. For emission point P-4 (auxiliary boiler), the the standard stack gas oxygen concentration is 3% O_2 by volume on a dry basis
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the EAEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has successfully completed both performance and compliance testing. The commissioning period shall not exceed 180 days under any circumstances.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
EAEC:	East Altamont Energy Center

(B) Applicability:

Conditions 1 through 16 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions 17 through 74 shall apply after the commissioning period has ended.

Conditions for the Commissioning Period

1. The owner/operator of the East Altamont Energy Center (EAEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1, S-3, and S-5 Gas Turbines and S-2, S-4, and S-6 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period.

2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1, S-3, & S-5 Gas Turbine combustors and S-2, S-4, & S-6 Heat Recovery Steam Generator duct burners to minimize the emissions of carbon monoxide and nitrogen oxides.

3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate the A-1, A-3, A-5, & A-7 Oxidation Catalysts and A-2, A-4, A-6, & A-8 SCR Systems to minimize the emissions of carbon monoxide and nitrogen oxides from S-1, S-3, & S-5 Gas Turbines, S-2, S-4, & S-6 Heat Recovery Steam Generators, and S-7 Auxiliary Boiler.

4. Coincident with the steady-state operation of A-2, A-4, & A-6 SCR Systems and A-1, A-3, A-5, & A-7 Oxidation Catalysts pursuant to conditions 3, 9, 10, and 11, the owner/operator shall operate the Gas Turbines (S-1, S-3, & S-5) and the HRSGs (S-2, S-4, & S-6) in such a manner as to comply with the NO_x and CO emission limitations specified in conditions 25(a) through 25(d).

5. Coincident with the steady-state operation of the A-8 SCR Systems and A-7 Oxidation Catalyst pursuant to conditions 3 and 12, the owner/operator shall operate the S-7 Auxiliary Boiler in such a manner as to comply with the NO_x and CO emission limitations specified in conditions 33(a) through 33(d).

6. The owner/operator of the EAEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1, S-3, or S-5 Gas Turbines describing the procedures to be followed during the commissioning of the turbines, HRSGs, auxiliary boiler, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1, S-3, & S-5), HRSGs (S-2, S-4, & S-6), and S-7 Auxiliary Boiler without abatement by their respective Oxidation Catalysts and/or SCR Systems. The owner/operator shall not fire any of the Gas Turbines (S-1, S-3, or S-5) sooner than 28 days after the District receives the commissioning plan.

7. During the commissioning period, the owner/operator of the EAEC shall demonstrate compliance with conditions 13, 14, and 15 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

   firing hours
   fuel flow rates
   stack gas nitrogen oxide emission concentrations,
   stack gas carbon monoxide emission concentrations
   stack gas oxygen concentrations.

   The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1, S-3, & S-5), HRSGs (S-2, S-4, & S-6), and S-7 Auxiliary Boiler. The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. The owner/operator shall retain records on site for at least 5 years from the date of entry and make such records available to District personnel upon request.

8. The owner/operator shall install, calibrate, and operate the District-approved continuous monitors specified in condition 7 prior to first firing of the Gas Turbines (S-1, S-3, & S-5), Heat Recovery Steam Generators (S-2, S-4, & S-6), and S-7 Auxiliary Boiler. After first firing of the turbines and/or auxiliary boiler, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

9. The owner/operator shall not fire the S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System and/or abatement of carbon monoxide emissions by A-1 Oxidation Catalyst for more than 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

10. The owner/operator shall not fire the S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-3 SCR System and/or abatement of carbon monoxide emissions by A-3 Oxidation Catalyst for more than 300 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

11. The owner/operator shall not fire the S-5 Gas Turbine and S-6 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-5 SCR System and/or abatement of carbon monoxide emissions by A-5 Oxidation Catalyst for more than 300 hours during the commissioning period. Such operation of S-5 Gas Turbine and S-6 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

12. The owner/operator shall not fire the S-7 Auxiliary Boiler without abatement of carbon monoxide emissions by A-7 Oxidation Catalyst and/or abatement of nitrogen oxide emissions by A-8 SCR System for more than 100 hours during the commissioning period. Such operation of S-7 Auxiliary Boiler without abatement by A-7 and/or A-8 shall be limited to discrete commissioning activities that can only be properly executed without the SCR system

and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 100 firing hours without abatement shall expire.

13. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the Gas Turbines (S-1, S-3, & S-5), Heat Recovery Steam Generators (S-2, S-4, & S-6), S-7 Auxiliary Boiler, S-9 Fire Pump Diesel Engine, and S-10 Emergency Generator during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition 35.

14. The owner/operator shall not operate the Gas Turbines (S-1, S-3, & S-5) and Heat Recovery Steam Generators (S-2, S-4, & S-6) in a manner such that the combined pollutant emissions from these sources will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1, S-3, & S-5).

NO_x (as NO_2)	4,805 pounds per calendar day	381 pounds per hour
CO	11,498 pounds per calendar day	930 pounds per hour
POC (as CH_4)	495 pounds per calendar day	
PM_{10}	660 pounds per calendar day	
SO_2	42 pounds per calendar day	

15. The owner/operator shall not operate the S-7 Auxiliary Boiler such that the pollutant emissions will exceed the following limits during the commissioning period. These emission limits shall include emissions that occur during Auxiliary Boiler start-ups.

NO_x (as NO_2)	428 pounds per calendar day	33 pounds per hour
CO	368 pounds per calendar day	22 pounds per hour
POC (as CH_4)	25.4 pounds per calendar day	
PM_{10}	96 pounds per calendar day	
SO_2	12.4 pounds per calendar day	

16. Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with the limitations specified in condition 26. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this condition. The District and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within 60 days of the source testing date.

Conditions for the Gas Turbines (S-1, S-3, & S-5) and the Heat Recovery Steam Generators (HRSGs; S-2, S-4, & S-6)

17. The owner/operator shall fire the Gas Turbines (S-1, S-3, and S-5) and HRSG Duct Burners (S-2, S-4, and S-6) exclusively with natural gas. (BACT for SO_2 and PM_{10})

18. The owner/operator shall not operate the units such that the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2, S-3 & S-4, and S-5 & S-6) exceeds 2,630.8 MM BTU (HHV) per hour, averaged over any rolling 3-hour period. (PSD for NO_x)

19. The owner/operator shall not operate the units such that the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2, S-3 & S-4, and S-5 & S-6) exceeds 63,139.2 MM BTU (HHV) per calendar day. (PSD for PM_{10})

20. The owner/operator shall not operate the units such that the combined cumulative heat input rate for the Gas Turbines (S-1, S-3, & S-5) and the HRSGs (S-2, S-4, & S-6) exceeds 61,100,064 MM BTU (HHV) per year. (Offsets)

21. The owner/operator shall not fire the HRSG duct burners (S-2, S-4, and S-6) unless its associated Gas Turbine (S-1, S-3, and S-5, respectively) is in operation. (BACT for NO_x)

22. The owner/operator shall ensure that the S-1 Gas Turbine and S-2 HRSG are abated by the properly operated and properly maintained A-2 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-2 SCR catalyst bed has reached minimum operating temperature. (BACT for NO_x)

23. The owner/operator shall ensure that the S-3 Gas Turbine and S-4 HRSG are abated by the properly operated and properly maintained A-4 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-4 SCR catalyst bed has reached minimum operating temperature. (BACT for NO_x)

24. The owner/operator shall ensure that the S-5 Gas Turbine and S-6 HRSG are abated by the properly operated and properly maintained A-6 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-6 SCR catalyst bed has reached minimum operating temperature. (BACT for NO_x)

25. The owner/operator shall ensure that the Gas Turbines (S-1, S-3, & S-5) and HRSGs (S-2, S-4, & S-6) comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, and Toxic Risk Management Policy)

    (a) Nitrogen oxide mass emissions (calculated as NO_2) at P-1 (the combined exhaust point for S-1 Gas Turbine and S-2 HRSG after abatement by A-2 SCR System) shall not exceed 19 pounds per hour or 0.00723 lb/MM BTU (HHV) of natural gas fired.

Nitrogen oxide mass emissions (calculated as NO_2) at P-2 (the combined exhaust point for S-3 Gas Turbine and S-4 HRSG after abatement by A-4 SCR System) shall not exceed 19 pounds per hour or 0.00723 lb/MM BTU (HHV) of natural gas fired.
Nitrogen oxide mass emissions (calculated as NO_2) at P-3 (the combined exhaust point for S-5 Gas Turbine and S-6 HRSG after abatement by A-6 SCR System) shall not exceed 19 pounds per hour or 0.00723 lb/MM BTU (HHV) of natural gas fired.
(PSD for NO_x)

(b) The nitrogen oxide emission concentration at emission points P-1, P-2, and P-3 each shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O_2, averaged over any 1-hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-1, P-2, and P-3 each shall not exceed 23.15 pounds per hour or 0.0088 lb/MM BTU of natural gas fired, averaged over any rolling 3-hour period. (PSD for CO)

(d) The carbon monoxide emission concentration at P-1, P-2, and P-3 each shall not exceed 4.0 ppmv, on a dry basis, corrected to 15% $O_{2,}$ averaged over any rolling 3-hour period. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-1, P-2, and P-3 each shall not exceed 10 ppmv, on a dry basis, corrected to 15% O_2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-2, A-4, and A-6 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-2, A-4, and A-6 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1, P-2, and P-3 shall be determined in accordance with permit condition 40. (TRMP for NH_3)

(f) Precursor organic compound (POC) mass emissions (as CH_4) at P-1, P-2, and P-3 each shall not exceed 6.64 pounds per hour or 0.00252 lb/MM BTU of natural gas fired. (BACT)

(g) Sulfur dioxide (SO_2) mass emissions at P-1, P-2, and P-3 each shall not exceed 1.84 pounds per hour or 0.0007 lb/MM BTU of natural gas fired. (BACT)

(h) Particulate matter (PM_{10}) mass emissions at P-1, P-2, and P-3 each shall not exceed 9 pounds per hour when the HRSG duct burners are not in operation. Particulate matter (PM_{10}) mass emissions at P-1, P-2, and P-3 each shall not exceed 11.5 pounds per hour when HRSG duct burners are in operation. (BACT)

(i) Compliance with the hourly NOx emission limitations specified in condition 25(a) and 25(b) shall not be required during short-term excursions limited to a cumulative total of 10 hours per rolling 12-month period. Short-term excursions are defined as 15-minute periods designated by the owner/operator that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average

NOx concentration exceeds 2.0 ppmv, dry @ 15% O_2. Examples of transient load conditions include, but are not limited to the following:

(1) Initiation/shutdown of combustion turbine inlet air cooling
(2) Initiation/shutdown of combustion turbine steam injection for power augmentation
(3) Rapid combustion turbine load changes
(4) Initiation/shutdown of HRSG duct burners

The maximum 1-hour average NOx concentration for periods that include short-term excursions shall not exceed 30 ppmv, dry @ 15% O_2. All emissions during short-term excursions shall be included in all calculations of hourly, daily, and annual mass emission rates as required by this permit.

26. The owner/operator shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1, S-3, and S-5) during a start-up or a shutdown does not exceed the limits established below. (PSD)

	Start-Up (lb/start-up)	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO_2)	240	80
Carbon Monoxide (CO)	2,514	902
Precursor Organic Compounds (as CH_4)	48	16

27. No more than one Gas Turbine (S-1, S-3, or S-5) shall be in start-up mode at any point in time. (PSD)

Conditions for S-7 Auxiliary Boiler

28. The owner/operator shall fire the Auxiliary Boiler exclusively with natural gas. (BACT for SO_2 and PM_{10})

29. The owner/operator shall not operate the unit such that the heat input rate to S-7 Auxiliary Boiler exceeds 129 million BTU per hour, averaged over any rolling 3-hour period. (Cumulative Increase)

30. The owner/operator shall not operate the unit such that the daily heat input rate to S-7 Auxiliary Boiler exceeds 3,096 million BTU per day. (Cumulative Increase)

31. The owner/operator shall not operate the unit such that the combined cumulative heat input rate to S-7 Auxiliary Boiler exceeds 387,000 million BTU per consecutive twelve month period. (Cumulative Increase)

32. The owner/operator shall ensure that S-7 Auxiliary Boiler exhaust gas is abated by A-7 Oxidation Catalyst and A-8 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at S-7 and the A-8 SCR catalyst bed has reached minimum operating temperature. (BACT)

33. The owner/operator shall ensure that S-7 Auxiliary Boiler complies with requirements (a) through (h) at all times, except during an auxiliary boiler start-up or shutdown. (BACT, PSD)
    (a) Nitrogen oxide mass emissions (calculated as NO_2) at P-4 (the exhaust point for S-7 Auxiliary Boiler, after abatement by A-7 Oxidation Catalyst and A-8 SCR System) shall not exceed 0.0114 lb/MM BTU (HHV) of natural gas fired or 1.5 pounds per hour, averaged over any rolling 3-hour period. (PSD for NO_x)

    (b) The nitrogen oxide emission concentration at P-4 shall not exceed 9.0 ppmv, on a dry basis, corrected to 3% O_2, averaged over any rolling 3-hour period. (BACT for NO_x)

    (c) Carbon monoxide mass emissions at P-4 (the exhaust point for S-7 Auxiliary Boiler, after abatement by A-7 Oxidation Catalyst) shall not exceed 0.0386 lb/MM BTU (HHV) of natural gas fired or 5.0 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)

    (d) The carbon monoxide emission concentration at P-4 shall not exceed 50 ppmv, on a dry basis, corrected to 3% O_2, averaged over any rolling 3-hour period. (BACT for CO)

    (e) The precursor organic compound (POC) mass emission rates at P-4 shall not exceed 0.6 pounds per hour. (BACT for POC)

    (f) The ammonia (NH_3) emission concentrations at P-4 shall not exceed 10 ppmv, on a dry basis, corrected to 3% O_2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-8 SCR System. The correlation between the auxiliary boiler heat input rates, A-8 SCR System ammonia injection rate, and corresponding ammonia emission concentration at emission points P-4 shall be determined in accordance with permit condition 55. (TRMP for NH_3)

    (g) Sulfur dioxide (SO_2) mass emissions at P-4 shall not exceed 0.09 pounds per hour or 0.0007 lb/MM BTU of natural gas fired. (BACT)

    (h) Particulate matter (PM_{10}) mass emissions at P-4 shall not exceed 2.65 pounds per hour or 0.0205 lb/MM BTU of natural gas fired. (BACT)

Conditions for All Sources

34. The owner/operator shall not allow total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4, S-5, and S-6), S-7 Auxiliary Boiler, S-9 Fire Pump Diesel Engine, and S-10 Emergency Generator, including emissions generated during Gas Turbine start-ups and shutdowns to exceed the following limits during any calendar day:

    (a) 2,030.4 pounds of NO_x (as NO_2) per day (CEQA)
    (b) 11,633.6 pounds of CO per day (PSD)
    (c) 569.3 pounds of POC (as CH_4) per day (CEQA)

(d)	949.4 pounds of PM_{10} per day	(PSD)
(e)	135.5 pounds of SO_2 per day	(BACT)

35. The owner/operator shall not allow cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4, S-5, and S-6), S-7 Auxiliary Boiler, S-8 Cooling Tower, S-9 Fire Pump Diesel Engine, and S-10 Emergency Generator, including emissions generated during gas turbine start-ups and shutdowns to exceed the following limits during any consecutive twelve-month period:

(a)	263 tons of NO_x (as NO_2) per year	(Offsets)
(b)	793.6 tons of CO per year	(Cumulative Increase, PSD)
(c)	73.7 tons of POC (as CH_4) per year	(Offsets)
(d)	148 tons of PM_{10} per year	(Offsets)
(e)	21.33 tons of SO_2 per year	(Cumulative Increase)

36. The owner/operator shall not allow the combined heat input rate to the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4, S-5, and S-6) and Auxiliary Boiler (S-7) to exceed 190,450 million BTU per calendar day. (PSD, CEC Offsets)

37. The owner/operator shall not allow the cumulative heat input rate to the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4, S-5, and S-6) and Auxiliary Boiler (S-7) combined to exceed 61,487,064 million BTU per year. (Offsets)

38. The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions (per condition 41) from the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4, S-5, & S-6) combined to exceed the following limits:

formaldehyde	9,874.2 pounds per year
benzene	199.3 pounds of per year
Specified polycyclic aromatic hydrocarbons (PAHs)	9.9 pounds of per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer risk, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

39. The owner/operator shall demonstrate compliance with conditions 18 through 21, 25(a) through 25(d), 26, 27, 29, 30, 31, 33(a) through 33(d), 34(a), 34(b), 35(a), and 35(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined, S-3 & S-4 combined, S-5 & S-6 combined, and S-7.
(b) Oxygen (O_2) Concentration, Nitrogen Oxides (NO_x) Concentration, and Carbon Monoxide (CO) Concentration at each of the following exhaust points:
P-1, P-2, P-3, and P-4.
(c) Ammonia injection rate at A-2, A-4, A-6, and A-8 SCR Systems

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

(e) Heat Input Rate for each of the following sources: S-1 & S-2 combined, S-3 & S-4 combined, S-5 & S-6 combined, and S-7.
(f) Corrected NO_x concentration, NO_x mass emission rate (as NO_2), corrected CO concentration, and CO mass emission rate at each of the following exhaust points: P-1, P-2, P-3, and P-4.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in conditions 39(e) and 39(f) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

(g) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
(h) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined, the auxiliary boiler and all seven sources (S-1, S-2, S-3, S-4, S-5, S-6, & S-7) combined.
(i) the average NO_x mass emission rate (as NO_2), CO mass emission rate, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.
(j) on an hourly basis, the cumulative total NO_x mass emissions (as NO_2) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, the auxiliary boiler, and all seven sources (S-1, S-2, S-3, S-4, S-5, S-6, & S-7) combined.
(k) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentration, NO_x mass emission rate (as NO_2), corrected CO emission concentration, and CO mass emission rate for each Gas Turbine and associated HRSG combined and the auxiliary boiler.
(l) on a daily basis, the cumulative total NO_x mass emissions (as NO_2) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all seven sources (S-1, S-2, S-3, S-4, S-5, S-6, & S-7) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

40. To demonstrate compliance with conditions 25(f), 25(g), 25(h), 26, 33(e), 33(g), 33(h), 34(c) through 34(e), and 35(c) through 35(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM_{10}) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO_2) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to condition 39, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

    (a) For each calendar day, POC, PM_{10}, and SO_2 emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all seven sources (S-1, S-2, S-3, S-4, S-5, S-6, & S-7) combined.
    (b) on a daily basis, the cumulative total POC, PM_{10}, and SO_2 mass emissions, for each year for all seven sources (S-1, S-2, S-3, S-4, S-5, S-6, & S-7) combined.

    (Offsets, PSD, Cumulative Increase)

41. To demonstrate compliance with Condition 38, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 61,100,064 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of heat input) determined by any source test of the S-1, S-3, and S-5 Gas Turbines and/or S-2, S-4, and S-6 Heat Recovery Steam Generators. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input rates during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to District review and approval. (TRMP)

42. Within 60 days of start-up of the EAEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1, P-2, or P-3 to determine the corrected ammonia (NH_3) emission concentration to determine compliance with condition 25(e). The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-2, A-4, or A-6 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1, P-2, or P-3. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to, minimum and full load, and steam injection power augmentation mode) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. Source testing shall be repeated on an annual basis thereafter. Ongoing compliance with condition 25(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. Source test results shall be submitted to the District and the CEC CPM within 90 days of conducting the tests. (TRMP)

43. Within 90 days of start-up of the EAEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1, P-2, and P-3 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with Conditions 25(a), (b), (c), (d), (f), (g), and (h), while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Conditions 25(c) and (d), and to verify the accuracy of the continuous emission monitors required in condition 39. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM_{10}) emissions including condensable particulate matter. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (BACT, offsets)

44. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (BACT)

45. Within 90 days of start-up of the EAEC and on a biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1, P-2, or P-3 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Condition 36. The gas turbine shall also be tested at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to condition 39 for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene	≤	6.7 pounds/year
Formaldehyde	≤	33 pounds/year
Specified PAHs	≤	0.044 pounds/year

(TRMP)

46. The owner/operator shall not allow the total combined sulfuric acid mist (SAM) emissions from S-1 through S-7 to exceed 7 tons totaled over any consecutive twelve month period. The SAM emission rate shall be calculated using the total heat input for the sources and the highest results of any source testing conducted pursuant to condition 47. If this SAM mass emission

limit is exceeded, the owner/operator must must utilize air dispersion modeling to determine the impact (in μg/m^3) of the sulfuric acid mist emissions pursuant to Regulation 2-2-306. (PSD)

47. Within 90 days of start-up of the EAEC and on a semi-annual basis (twice per year) thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 through P-4 while each gas turbine, HRSG duct burner, and auxiliary boiler is operating at maximum heat input rates to demonstrate compliance with the SAM emission rates specified in condition 46. The owner/operator shall test for (as a minimum) SO_2, SO_3, and H_2SO_4. After acquiring one year of source test data on these sources, the owner/operator may petition the District to reduce the test frequency to an annual basis if test result variability is sufficiently low as determined by the District. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (PSD)

48. The owner/operator of the EAEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

49. The owner/operator of the EAEC shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)

50. The owner/operator of the EAEC shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

51. The owner/operator shall ensure that the stack height of emission points P-1, P-2, and P-3 is each at least 175 feet above grade level at the stack base. (PSD, TRMP)

52. The owner/operator shall ensure that the stack height of emission point P-4 is at least 120 feet above grade level at the stack base. (PSD, TRMP)

53. The Owner/Operator of EAEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall comply with the District Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval. (Regulation 1-501)

54. Within 180 days of the issuance of the Authority to Construct for the EAEC, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by conditions 39, 42, 43, 45, and 60. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

55. Prior to the issuance of the BAAQMD Authority to Construct for the East Altamont Energy Center, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of 302.45 tons/year of Nitrogen Oxides, 84.755 tons/year of Precursor Organic Compounds, and 148 tons/year of PM_{10} or equivalent (as defined by District Regulations 2-2-302.1 and 2-2-302.2) are under their control through enforceable contracts, option to purchase agreements, or equivalent binding legal documents. (Offsets)

56. Prior to the start of construction of the East Altamont Energy Center, the Owner/Operator shall provide to the District valid emission reduction credit banking certificates in the amount of 302.45 tons/year of Nitrogen Oxides, 84.755 tons/year of Precursor Organic Compounds, and 148 tons/year of PM_{10} or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets, CEC)

57. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the EAEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of completing construction as demonstrated by the first firing of any gas turbine, HRSG duct burner, or auxiliary boiler. (Regulation 2-6-404.1)

58. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the East Altamont Energy Center shall submit an application for a Title IV operating permit to the BAAQMD at least 24 months before operation of any of the gas turbines (S-1, S-3, or S-5) or HRSGs (S-2, S-4, or S-6). (Regulation 2, Rule 7)

59. The East Altamont Energy Center shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

60. The owner/operator shall take monthly samples of the natural gas combusted at the EAEC. The samples shall be analyzed for sulfur content using District-approved laboratory methods. The sulfur content test results shall be retained on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)

Permit Conditions for S-8 Cooling Tower

61. The owner/operator shall properly install and maintain the cooling towers to minimize drift losses. The owner/operator shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 3,400 ppmw (mg/l). The owner/operator

shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (PSD)

62. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the East Altamont Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM_{10} emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in condition 61. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in condition 61. (PSD)

63. S-1, S-3, and S-5 Gas Turbines shall each be equipped with air inlet filter(s) and lube oil vent coalescer(s). (BACT for PM_{10})

Permit Conditions for S-9 Fire Pump Diesel Engine

64. S-9 Fire Pump Diesel Engine is subject to the requirements of Regulation 9, Rule 1 ("Sulfur Dioxide"), and the requirements of Regulation 6 ("Particulate and Visible Emissions"). The engine may be subject to other District regulations, including Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines") in the future.
(Regulation 9, Rule 1, Regulation 6)

65. The owner/operator shall ensure that S-9 burns no more than 1,420 gallons of diesel fuel totaled over any consecutive 12 month period for the purpose of reliability-related activities as defined by Regulation 9-8-232. (Offsets, BACT)

66. The owner/operator may cause S-9 to burn an unlimited amount of diesel fuel for the purpose of providing power for the emergency pumping of water. (Regulation 9-8-330.1)

67. The owner/operator shall equip S-9 with a non-resettable totalizing counter which records fuel use. (cumulative increase)

68. The owner/operator shall ensure that the sulfur content of all diesel fuel combusted at S-9 does not exceed 0.05% by weight. (TRMP, TBACT)

69. The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and make such records and logs available to the District upon request:

    a) total fuel use for S-9 for the purpose of reliability testing
    b) total fuel use for S-9 for the purpose of emergency pumping of water
    c) fuel sulfur content
    (cumulative increase)

Permit Conditions for S-10 Emergency Generator

70. S-10 Emergency Generator is subject to the requirements of Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines") and the requirements of Regulation 6 ("Particulate and Visible Emissions"). (Regulation 9, Rule 8, Regulation 6)

71. The owner/operator shall ensure that S-10 burns no more than 1,150 MM BTU (HHV) of natural gas totaled over any consecutive 12-month period nor 11.5 MM BTU (HHV) of natural gas per day for the purpose of reliability-related activities as defined by Regulation 9-8-232. (Offsets, BACT)

72. The owner/operator may cause S-10 to burn an unlimited amount of natural gas for the purpose of emergency use as defined by Regulation 9-8-221. (Regulation 9-8-330.1)

73. The owner/operator shall equip S-10 with a non-resettable totalizing counter which records fuel use. (cumulative increase)

74. The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and make such records available to the District upon request:

    a) total fuel consumption for S-10 for the purpose of reliability testing
    b) total fuel consumption for S-10 for the purpose of emergency use
    (cumulative increase)

75. The owner/operator shall not operate both S-9 Fire Pump Diesel Engine and S-10 Emergency Generator on the same calendar day for the purposes of reliability-related activities. (PSD)

VI Recommendation

The APCO has concluded that the proposed East Altamont Energy Center power plant, which is composed of the permitted sources listed below, complies with all applicable District rules and regulations, provided the facility complies with the permit conditions contained in this document. Note that approval of the proposed SO_2 for PM_{10} offset package is subject to public comment and USEPA review and concurrence. Public comment was sought during the PDOC comment period and the District's analysis of the offset proposal has been sent to USEPA for review. No comments were received from USEPA or CARB on the PDOC.

The following sources will be subject to the permit conditions and BACT and offset requirements discussed previously.

S-1 Combustion Gas Turbine #1, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-2 Heat Recovery Steam Generator #1, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-1 Oxidation Catalyst and A-2 Selective Catalytic Reduction System

S-3 Combustion Gas Turbine #2, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-4 Heat Recovery Steam Generator #2, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-3 Oxidation Catalyst and A-4 Selective Catalytic Reduction System

S-5 Combustion Gas Turbine #3, General Electric PG 7251 (7FB); 1898.8 MM BTU per hour, equipped with dry low-NO_x Combustors, abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System

S-6 Heat Recovery Steam Generator #3, equipped with dry low-NO_x Duct Burners, 732 MM BTU per hour, abated by A-5 Oxidation Catalyst and A-6 Selective Catalytic Reduction System

S-7 Auxiliary Boiler, 129 MM BTU/hr, equipped with dry low-NOx burners, abated by A-7 Oxidation Catalyst and A-8 Selective Catalytic Reduction System

S-8 Cooling Tower, 19-Cell, 16,938,000 gallons per hour

S-9 Fire Pump Diesel Engine, Clarke Model JDFP-06WR, 4-cycle, In-Line, 6-Cylinder, turbocharged, lean-burn, 496 cubic inch displacement, 300 bhp, 14.2 gallons per hour maximum fuel use rate

S-10 Emergency Generator, Natural-Gas Fired Engine, Cummins Model QSV81; 1529 bhp, 11.5 MM BTU/hr, 4-stroke, lean-burn, V-16, turbocharged, aftercooled

Pursuant to District Regulation 2-3-404, this document is subject to the public notice, public comment, and public inspection requirements of Regulation 2-2-406 and 2-2-407. Accordingly, a notice inviting written public comment was published in the Oakland Tribune on April 17, 2002. The public inspection and comment period ended on May 17, 2002. All written comments received were responded to in writing and addressed as appropriate in this FDOC.

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